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ABSTRACT

This study evaluated whether or not locus of control mediates rational-irrational beliefs. Data were generated investigating the impact of an internal-external orientation and selected demographic variables (age, race, gender, education, and occupation) on rational-irrational beliefs. Independent variables were locus of control and demographic characteristics, and the dependent variable was beliefs. Data were collected by administering the Internal-External Locus of Control Scale and the Irrational Beliefs Test to 105 state human service agency employees (81 internals and 24 externals). A one-way analysis of variance uncovered significant differences in internal and external females. In addition, there were significant differences in beliefs between internal and external subjects at different educational levels. Results support the view that internally oriented individuals maintain more rational beliefs than do externally oriented people. Nine tables present study data. (SLD)

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# THE EFFECTS OF INTERNAL-EXTERNAL LOCUS OF CONTROL AND SELECTED DEMOGRAPHIC VARIABLES ON RATIONAL-IRRATIONAL BELIEFS

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## ABSTRACT

Commonalities exist between social leaning and cognitive behavior theories. Yet, there is a dearth of supportive empirical evidence.

Data were generated investigating an internal-external orientation and selected demographic variables (i.e. age, race, gender, education, and occupation) on rational-irrational beliefs. Independent variables were locus of control and demographic characteristics; the dependent variable was beliefs. Data were collected through administering the Internal-External Locus of Control Scale and the Irrational Beliefs Test (IBT) to state human service agency employees (n=105). Kruskal-Wallis one-way analysis of variance was the statistical procedure used to analyze the data. When statistical significance ($p<.05$) was established, the Mann-Whitney U test was the follow-up procedure.

The following results occured: (1) significant differences in beliefs between internal and external females were obtained and (2) significant differences in beliefs between internal and external subjects were also found at different educational levels.

Although no differences in beliefs between locus of control and age, race, or occupation were obtained, the aforesaid results provided some support that internally oriented individuals maintain more rational beliefs than externally oriented people (e.g. subjects completing graduate school held more rational belifes than did subjects with baccalaureate degrees).

## INTRODUCTION

Theoretical commonalities exist between social learning theory (Rotter, 1960), especially regarding the locus of control construct and the cognitive-behavioral underpinnings of rational-emotive therapy (Ellis & Grieger, 1977). Major areas of consistency between these two psychological frames of reference include the impact of perceptions such as one's perceived ability to influence the outcomes of life events and the interpretations of reality in shaping an individual's behavior.

Even though Martin, Head and Lindsey (1991) reported data supporting various theoretical commonalities among the aforesaid orientations (i.e. internal locus of control subjects exhibited more rational beliefs and external locus of control subjects maintained more irrational beliefs) a dearth of empirical evidence exists. Thus, this research is a sequel to the aforementioned study attempting to add to the body of knowledge pertaining to locus of control and beliefs regarding the following demographic variables: age, race, gender, education, and occupation

## METHOD

The Internal-External Locus of Control Scale (I-E Scale) Rotter, 1966) measured the internal-external locus of control construct. This self-report, "forced-choice" inventory consists of 29 statements presented in a true-false format including six filler items. Scores can range from 0 to 23 in which low scores reflect an internal orientation and high scores reflect an external orientation (Higgins, Moracco, & Danford, 1981). In this investigation, low scores (i.e. 11 or lower) exhibited fewer external responses and high scores (i.e. 12 or higher) exhibited more external responses.

Rotter (1966) reported moderately high internal consistency coefficient value ranging from .65 to .79 with several sampling groups. Test- retest reliability as reported by Husa (1982) ranged from .49 to .83. Split-half and Kuder-Richardson reliability for total socres clustered around .70 (Anastasi, 1982).

Correlations (i.e. .55 to .61) between the Internal-External Locus of Control Scale and other methods assessing the locus of control construct such as story completion and questionnaires provide empirical support of its convergent validity (Rotter, 1966). Low correlations between this scale and instruments measuring social desirability (e.g. - .12 to - .41) and intelligence (e.g. -.22 to .03) provide supportive evidence for its discriminant validity. Additional investigations (Hersch & Scheibe, 1967, Harrow & Ferrante, 1969; Joe, 1971) repeated Rotter's findings. Thus subsequent data were generated supporting this scale's construct validation.

The rationality construct developed within Ellis' (1962) 10 core irrational beliefs' framework was measured by the Irrational Beliefs Tests (IBT) (Jones, 1968). This instrument, also a self-report inventory consists of 100 items in which 10 statements assess each of the 10 irrational-beliefs.

Jones (1968) reproted cross validation of the IBT's construct validity ranging from .56 to .82 with a mean of .70. Homogeneous reliability coefficient values were obtained for this instrument ranging from .66 to .80 with a mean of .74. Test-retest reliability were .92 and ranged from .68 to .87 for IBT full-scale and subscales, respectively. Trexler and Karst (1972 and 1973) as well as Lohr and Bonge (1981) reported similar reliability findings.

Data were generated by administering the aforementioned instruments to state and local human serivce agency employees (n=105). Subclassifications of the same demographic groupings were then combined within the internal as well as external locus of control categories in order to prepare the data for statistical analyses (see Table 1).

The Kruskal-Wallis one way analysis of variance procedure was used to analyze the data. When statistical significance ($p<.05$) for this nonparametric technique was obtained the Mann-Whitney U Test was employed as a follow-up procedure. Internal-External locus of control and selected demographic variables (i.e. age, race, gender, education, and occupation were the independent variables. Scores from the IBT were utilized as the dependent variable.

The following five null hypotheses were tested.

Null Hypothesis I:

No significant differences in beliefs exists among internally or externally oriented subjects in different age categories.

Null Hypothesis II:

No significant differences in beliefs exists among internally or externally oriented subjects in different racial categories.

Null Hypothesis III:

No significant differences in beliefs exists among internally or externally oriented subjects in different gender categories.

Null Hypothesis IV:

No significant differences in beliefs exists among internally or externally oriented subjects in different educational categories.

Table 1

Locus of Control Categories and Demographic Subcategories

| Locus of Control Category | Demographic Category |
|---|---|
| Internal | Age |
| | 42 - 75 |
| | 37 - 41 |
| | 32 - 36 |
| | 22 - 31 |
| External | 42 - 75 |
| | 37 - 41 |
| | 32 - 36 |
| | 22 - 31 |
| Internal | Race |
| | White |
| | Non-White |
| External | White |
| | Non-White |
| Intenal | Gender |
| | Male |
| | Female |
| External | Male |
| | Female |
| Internal | Education |
| | Graduate Degree |
| | Some Graduate School |

| Locus of Control Category | Demographic Category |
|---|---|
| | Baccalaureate Degree |
| | Some College |
| | High School Diploma |
| External | Graduate Degree |
| | Some Graduate School |
| | Baccalaureate Degree |
| | Some College |
| | High School Diploma |
| Internal | Occupation |
| | Administrator |
| | Professional |
| | Non-Professional |
| External | Administrator |
| | Professional |
| | Non-Professional |

Null Hypothesis V:

No significant differences in beliefs exists among internally or externally oriented subjects in different occupational categories.

## RESULTS

The following results were obtained from analysis of data by using statistical programs from the Statistical package for Social Science (SPSS).

Since the homogeneity of cell variance assumption was violated (see Table II) for hypotheses I through V as indicated by Hartley's F-max test the two-way-analysis of variance results were not reviewed. Thus, Kruskal-Wallis, a non-parametric procedure, was selected for testing each null hypothesis.

Null Hypothesis I

The results of the Kruskal-Wallis one-way analysis of variance procedure produced a finding of $X^2 = 12.69$ ($p = .08$) (Table III). Thus, there is insufficient evidence to reject this null hypothesis at the 95% level of confidence. In this investigation it is appropriate to conclude there is no difference in beliefs among internally or externally oriented subject varying in age.

Null Hypothesis II

Using the Kruskal-Wallis procedure a result of $X^2 = 5.14$ ($p = .162$) (Table IV) was obtained. Therefore no significant differences among locus of control and race were obtained at the .05 rejection level with regard to rational- irrational beliefs.

Null Hypothesis III

Based on the analysis of data by using the Kruskal-Wallis procedure an outcome of $X^2 = 9.81$ ($p = .02$) (Table V) occurred. Thus, this null hypothesis was rejected at the .05 level which indicated that at least one of the four gender groups differed significantly from one or more of the other gender groups regarding rational-irrational beliefs.

In order to determine which gender group or groups differed significantly from the other groups, the Mann-Whitney U test was used as the follow-up procedure. Since the overall or experiment-wise error rate ($\alpha = .05$) is inflated by each individual multiple comparison (Glass & Stanley, 1970), a hypothesis-wise error was calculated at $\alpha = .008$. Thus, it is appropriate to conclude that internally oriented females exhibited more rational beliefs than externally oriented females who exhibited more irrational beliefs (Table VI).

Table II

Test for Homogeneity of Cell Variances

Hartley's F-max

| Hypothesis No. | Demographic Variables | DF | Critical F-max* | Calculated F-max |
|---|---|---|---|---|
| I | Age | 33,8 | 3.12 | 5.30 |
| II | Race | 71,4 | 1.96 | 224.90 |
| III | Gender | 48,4 | 2.61 | 2.97 |
| IV | Education | 24,10 | 4.37 | 1087.12 |
| V | Occupation | 30,6 | 2.91 | 2.98 |

*$p < .05$

Table III

Kruskal - Wallis Procedure

IBT Scores by Locus of Control and Age

| Locus of Control Category | Age Groups | $\bar{X}$ | s | n | Mean Ranks |
|---|---|---|---|---|---|
| Internal | 42 - 75 | 287.29 | 25.29 | 34 | 48.57 |
| | 37 - 41 | 286.93 | 24.65 | 15 | 51.23 |
| | 32 - 36 | 276.06 | 31.21 | 17 | 40.24 |
| | 22 - 31 | 296.13 | 26.06 | 15 | 61.60 |
| External | 42 - 75 | 284.00 | 20.43 | 7 | 47.07 |
| | 37 - 41 | 326.50 | 33.97 | 5 | 85.63 |
| | 32 - 36 | 308.00 | 41.24 | 6 | 61.50 |
| | 22 - 31 | 302.43 | 17.91 | 7 | 70.86 |

$X^2$ = 12.69

$p$ = .08

Table IV

Kruskal-Wallis Procedure

IBT Scores by Locus of Control and Race

| Locus of Control Category | Racial Group | $\bar{X}$ | s | n | Mean Rank |
|---|---|---|---|---|---|
| Internal | White | 286.83 | 27.48 | 72 | 49.99 |
| | Non-White | 283.89 | 23.17 | 9 | 47.90 |
| External | White | 302.00 | 31.78 | 22 | 62.16 |
| | Non-White | 307.50 | 2.12 | 2 | 84.75 |

$X^2 = 5.14$

$p = .162$

Table V

Kruskal-Wallis Procedure

IBT Scores by Locus of Control and Gender

| Locus of Control Category | Gender Group | $\bar{X}$ | s | n | Mean Ranks |
|---|---|---|---|---|---|
| Internal | Male | 283.66 | 32.96 | 32 | 49.09 |
| | Female | 288.37 | 22.30 | 49 | 50.14 |
| External | Male | 283.00 | 19.12 | 9 | 44.89 |
| | Female | 314.13 | 30.35 | 15 | 75.53 |

$X^2 = 9.81$

$p = .02$

Table VI

Mann-Whitney U Test

Internal or External Gender Groups

| Groups | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 1. Internal Males | -- | .8166 | .2048 | .0141 |
| 2. Internal Females | -- | -- | .5475 | .0023* |
| 3. External Males | -- | -- | -- | .0216 |
| 4. External Females | -- | -- | -- | -- |

*$\alpha <$ .008

Null Hypothesis IV

Since a finding of $\underline{X}^2$= 24.11 ($\underline{p}$ = .004) (Table VII) was obtained by using the Kruskal-Wallis procedure, this null hypothesis was rejected. At least one significant difference exists regarding rational-irrational beliefs among the 10 educational groups at the 95% level of confidence.

To determine which educational group or groups differed from the other groups, the Mann-Whitney U test was employed as the follow-up procedure. Since each individual multiple comparison inflates the overall or experiment-wise error rate ($\alpha$= .05), the hypothesis-wise error was calculated to be $\alpha$=.001. Thus, it is appropriate to conclude internally oriented subject with graduate degrees exhibited more rational beliefs in contrast to externally oriented subjects with bacculaureate degrees who exhibited more irrational beliefs (Table VIII).

Null Hypothesis V

A finding of $\underline{X}^2$ = 5.88 ($\underline{p}$=.318) (Table IX) was obtained by using the Kruskal-Wallis procedure. Thus, there was not sufficient evidence to reject this null hypothesis at the 95% level of confidence with regard to rational-irrational beliefs among locus of control and occupation.

## DISCUSSION

Since statistically significant differences ($\underline{p}$ < .05) only were obtained between internally and externally oriented female subjects, the data support that the locus of control construct mediates rational-irrational beliefs for females but not for males. Thus, the anticipated gender differences in beliefs between male and female subjects were not established in this investigation. Yet, these results provided some support for anticipated differences between internally and externally oriented subjects regarding irrational beliefs (Cash, 1984; Martin et al., 1976; Thyer & Papsdorf, 1981; Wright & Pihl, 1981).

As anticipated from prevailing literature, subjects with a higher educational level (i.e. graduate school completion) held more rational beliefs than did subjects with a lower educational level (i.e. baccalaureate degree obtainment). This reserch was not consistant with prior studies for the following reasons: (1) no significant differences ($\underline{p}$ > .05) were obtained between the lowest educational level (high school completion) and the highest educational level (i.e. graduate school completion) and (2) other researchers (Hendricks et al., 1984; Lefcourt, 1976) support the conclusion that individuals with less education were more externally oriented and individuals with more education were more internally oriented. Additionally no support was obtained in this research that age, race and occupation interact with the locus of control construct regarding the effect on beliefs.

Table VII

Kruskal -Wallis Procedure

IBT Scores by Locus of Control and Educational Level

| I-E Category Group No. | Educational Level | $\bar{X}$ | s | n | Mean Ranks |
|---|---|---|---|---|---|
| Internal | | | | | |
| 1 | Graduate Degree | 275.00 | 23.14 | 25 | 35.70 |
| 2 | Some GRaduate School | 278.67 | 26.19 | 12 | 39.96 |
| 3 | Baccalaureate Degree | 293.35 | 32.97 | 17 | 59.82 |
| 4 | Some College | 297.72 | 24.80 | 18 | 62.03 |
| 5 | High School Diploma | 293.56 | 16.50 | 9 | 58.06 |
| External | | | | | |
| 6 | Graduate Degree | 290.00 | 12.82 | 7 | 54.36 |
| 7 | Some Graduate School | 273.00 | 24.43 | 1 | 24.00 |
| 8 | Baccalaureate Degree | 315.92 | 32.82 | 12 | 76.75 |
| 9 | Some college | 276.00 | 22.61 | 3 | 37.83 |
| 10 | High School Diploma | 337.00 | 0.00 | 1 | 98.00 |

$X^2 = 24.11$

$p = .004$

Table VIII

Mann-Whitney U

Test for Internal or External Educational Groups

| Group | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -- | .6848 | .0108 | .0048 | .0422 | .1053 | .9468 | .0007* | .8818 | .0953 |
| 2 | -- | -- | .0841 | .0465 | .1353 | .2045 | .8934 | .0153 | .9424 | .1083 |
| 3 | -- | -- | -- | .7790 | .7057 | .5045 | .1481 | .0628 | .3144 | .2100 |
| 4 | -- | -- | -- | -- | .7187 | .6495 | .2349 | .1498 | .1746 | .1440 |
| 5 | -- | -- | -- | -- | -- | .7102 | .1161 | .1096 | .3083 | .1161 |
| 6 | -- | -- | -- | -- | -- | -- | .1244 | .0625 | .5676 | .1244 |
| 7 | -- | -- | -- | -- | -- | -- | -- | .1814 | .6547 | .3173 |
| 8 | -- | -- | -- | -- | -- | -- | -- | -- | .0304 | .5930 |
| 9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | .1797 |
| 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

$\alpha < .001$

Table IX

Kruskal-Wallis Procedure

IBT Scores by Locus of Control and Occupation

| Locus of Control Category | Occupational Group | $\bar{X}$ | s | n | Mean Ranks |
|---|---|---|---|---|---|
| Internal | Administrators | 285.20 | 33.97 | 25 | 48.78 |
| | Professionals | 283.23 | 21.65 | 30 | 46.05 |
| | Non-Professionals | 291.54 | 25.04 | 26 | 54.88 |
| External | Administrators | 295.88 | 24.35 | 8 | 57.88 |
| | Professionals | 308.46 | 37.37 | 11 | 68.64 |
| | Non-Professionals | 299.80 | 24.40 | 5 | 63.80 |

$X^2$ = 5.88

p = .318

Since this study was limited to a small number of agency employees in a specific geographical area, demographic differences involving the locus of control construct and beliefs not found in this investigation may actually exists. Thus, it is recommended that replication of this research be conducted involving a larger, more heterogeneous population from which random samples are drawn. Since the locus of control orientation as well as the rational-irrational beliefs that a person maintains have important emotional and behavioral ramifications (Joe, 1971; Lefcourt, 1966, 1972, Hersch & Scheibe, 1967; Bettelheim, 1952; Elkins, 1961, Altmaier & Happ, 1985; Roth & Bootzin, 1974; Valine & Phillips, 1984; Ellis & Grieger, 1977) it is further recommended that the aforesaid variables including the demographic variables studied in this investigation be researched in regard to the therapist-client relationship.

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